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The way to improvement of the method of calculation of rigidity of bending reinforced concrete elements from conventional ferro-concrete

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Abstract

© Published under licence by IOP Publishing Ltd. The aim of the research was to improve the physical model of deformation of a bent ferro-concrete element with cracks on the basis of modern achievements in the theory of damage accumulation and fracture mechanics. The presented model allows to determine the rigidity of the element in the operation stage taking into account the damage, the work of the stretched concrete over the macrocrack, the concentration of stresses at its apex, and the presence of a pre-destruction zone in it. The analysis of the results of calculating the rigidity of elements with different percentages of reinforcement by the proposed method and the diagram method using different diagrams of concrete deformation is performed. It has been established that the work of stretched concrete over the macrocrack has a greater effect on the rigidity at a load exceeding the cracking time by no more than 30%, which is especially pronounced in strongly reinforced elements (up to 48%).

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